5034-WM-HM

2-Channel Load Cell Input Module

User Manual

GENERAL INFORMATION

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Throughout this manual we use notes to make you aware of safety considerations.

ATTENTION: Identifies information about practices or circumstances that can lead to property damage. Identifies information that is especially important for successful application and understanding of the product.

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Preface

Who Should Use This Manual

This manual illustrates the installation and operation of the 5034-WM-HM. It is written for those who are responsible for design, installation, programming, or maintenance of an automation control system that uses the module.

You should understand electronic process control and be able to interpret the ladder logic instructions required to generate the electronic signals that control your application. If you do not, contact your local Allen-Bradley representative for the proper training before using this product

Terms and Abbreviations

Calibration - Procedure, performed by trained personnel, where machine or press is dynamically loaded to impact on load cells. A process of linearity measuring to determine the loading capacity of the machine.
Calibration Number - Amplification values established during machine calibration or pre-assigned on force load cells.
Channel - Refers to one of two, strain gage inputs available on the modules terminal block.
Chassis - A hardware assembly that houses devices such as I/O modules, adapter modules, processor modules, and power supplies.
Load/Force - Measurement of impact during a machine cycle. Sensors provide the input for this measurement.
Resolution - The smallest detectable change in a measurement, typically expressed in engineering units (e.g. 0.15C) or as a number of bits. For example, a 12-bit system has 4,096 possible output states. It can therefore measure 1 part in 4096.
Sample - Load/force values established from a series of machine cycles. Also defined as benchmark.

Product Support

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- Sales and Order Support
- Product Technical Training
- Warranty Support
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Rev. A (Feb. 2026)

Module Overview

The 5034-WM-HM is a 2 Channel Load Cell Input Module that provides accurate and reliable measurements for weighing applications. Using load cell input the 5034-WM-HM module internally amplifies, conditions, and filters incoming signals providing stable force measurement. Integration is simple using the included AOP to enable fast and straight forward setup. The 5034-WM-HM is the perfect solution for your process weighing, batching, filling, blending, and thermoforming applications

Key Features

- 2 Independent Channels
- 1 millisecond update time
- ADC Resolution of 18 Bits
- Internal amplification and signal conditioning
- Accepts Industry standard load cells
- Enhanced with an add-on profile (AOP)
- Software selectable filtering
- Built-in tare functionality

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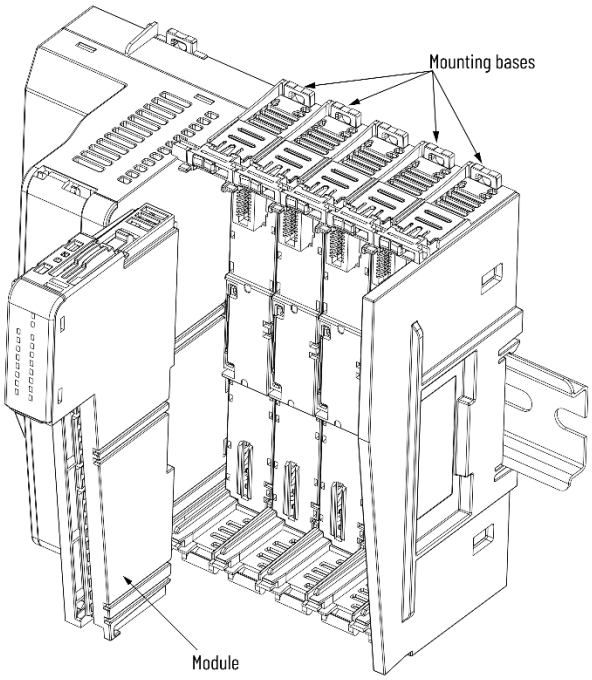
Installation and Wiring

ATTENTION: For complete installation procedures of the PointMax I/O system, refer to the official *"PointMax I/O System Installation"* document. This manual provides supporting guidance, but the official document should be used as the final source of instruction.

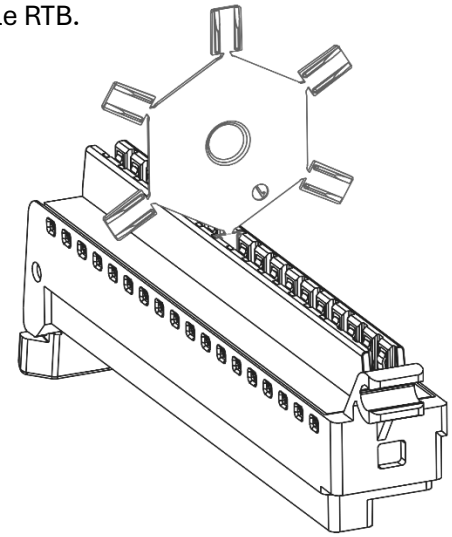
Installing the Module

1. With even force on the top and bottom, insert the 5034-WM-HM into the mounting base. The lock at the top of the module should lock into the mounting base.



Installing the RTB Keys

1. The 5034-WM-HM supports RTB keying to prevent incompatible terminal blocks from being installed into the module. The key slots for the 5034-WM-HM are 3,7, and 9. Installation of the keys is not required however, it is recommended to deter installation of a potentially catastrophically incompatible RTB.



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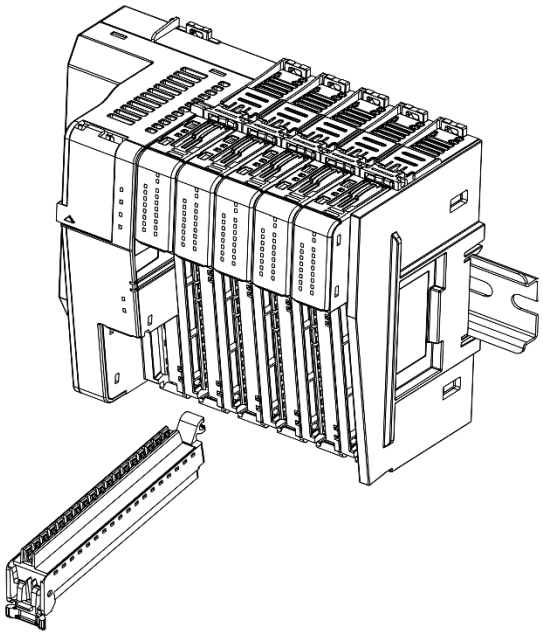
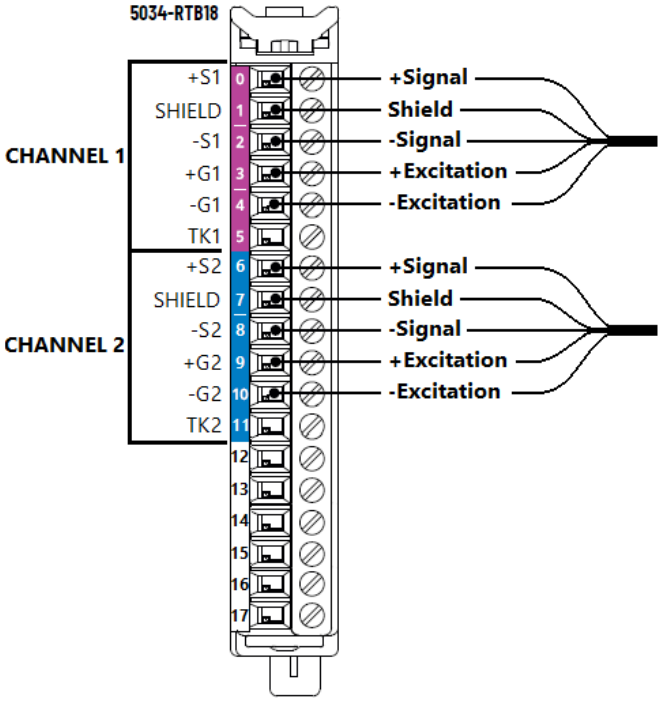
Installing the Removeable Terminal Block (RTB)

1. Attach the RTB pivot clip into the mounting base by firmly pressing it into place. Rotate the RTB until it latches securely into the module.



Wiring

Below is a diagram of the wiring guide of two independent channels for the RTB.



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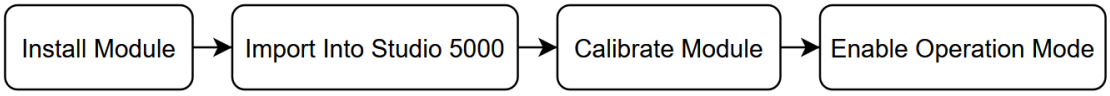
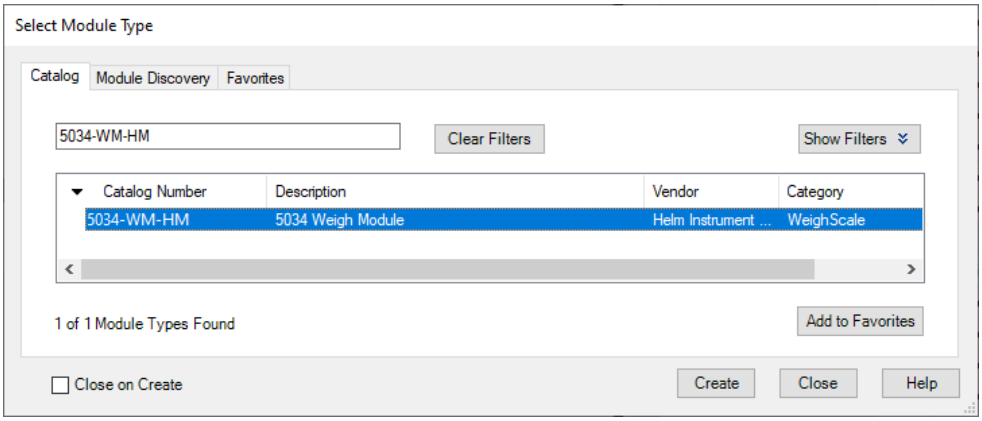
Setup and Usage

Setup of the 5034-WM-HM is streamlined so that there are minimal steps needed to have the module fully functional. **Below is a flow chart detailing the required steps to set up and operate the module.**



1) Importing the Module into Studio 5000

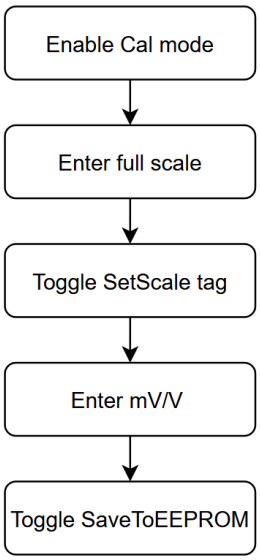
This module includes an Add-On Profile (AOP) for seamless integration. At this time, the AOP must be manually installed. In a future release, the AOP will be integrated into Studio 5000 eliminating the need for manually install add-on profile.



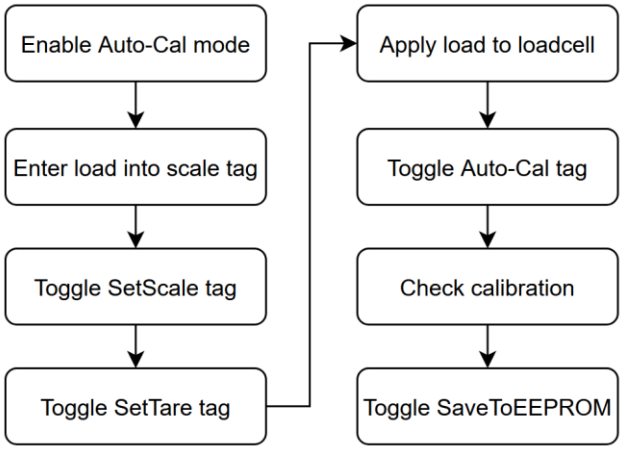
2) Calibration

Calibration can be done in two different ways, Automatic Calibration or Standard Calibration. Automatic calibration requires a known load while the Standard Calibration requires maximum capacity and mV/V of the load cell. Choosing which calibration is entirely up to the user, however automatic calibration is recommended as it can be more accurate. Below are flow charts outlining the basic process of each calibration.

Standard Calibration



Automatic Calibration



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a.) Automatic Calibration

Auto calibration or Auto-Cal is a process that allows the module to calibrate against a known load without a known mV/V. This process requires a known load to be placed on the loadcell as well as specific tags of each of the channels to be toggled. Below is an example of this process with sample values.

> **ATTENTION:** The following calibration steps are channel specific. Before completing each step, verify that you are working on the intended channel and all required bits are set accordingly.

1. Set AutoCalMode and CalMode (Turn off WeightMode)

A:1:O.CalMode	1		Decimal	BOOL
A:1:O.WeighMode	0		Decimal	BOOL
A:1:O.AutoCalMode	1		Decimal	BOOL

2. Enter known load weight in the scale tag

A:1:O.Ch01.Scale	5000		Decimal	UDINT

3. Toggle the SetScale tag

A:1:O.Ch01.SetScale	1		Decimal	BOOL

4. **Ensure there is no load on the loadcell**
5. Toggle the SetTare tag

A:1:O.Ch01.SetTare	1		Decimal	BOOL

6. Apply the known reference load to the loadcell
7. Toggle the AutoCal tag

A:1:O.Ch01.AutoCal	1		Decimal	BOOL

8. Change mode to Weigh Mode to verify that the calibration worked

A:1:O.CalMode	0		Decimal	BOOL
A:1:O.WeighMode	1		Decimal	BOOL
A:1:O.AutoCalMode	1		Decimal	BOOL

9. Toggle SaveToEEPROM tag (Saves calibration value internally)

A:1:O.SaveToEEProm	1		Decimal	BOOL

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b.) Standard Calibration

Standard calibration is a process that allows the modules to be calibrated using the mV/V and scale of the loadcell. Below is an example of this process with sample values.

1. Set CalMode (Turn off Cal and Weigh Mode)

A:1:O.CalMode	1		Decimal	BOOL
A:1:O.WeighMode	0		Decimal	BOOL
A:1:O.AutoCalMode	0		Decimal	BOOL

2. Enter scale of loadcell into the scale tag

A:1:O.Ch01.Scale	5000		Decimal	UDINT

3. Toggle the SetScale tag

A:1:O.Ch01.SetScale	1		Decimal	BOOL

4. Enter the mV/V into the mV_V tag

A:1:O.Ch01.Mv_V	2000		Decimal	UDINT

5. Toggle the SaveToEEPROM tag

A:1:O.SaveToEEProm	1		Decimal	BOOL

3) Operation

The Calibration method used determines the operating mode required for normal operation. ***During normal operation, the module must have "WeighMode" enabled regardless of the calibration method***. If the module was calibrated using standard calibration, it must operate only in "WeighMode" during normal operation. ***If the module was calibrated using automatic calibration, the "AutoCalMode" tag must also be enabled during normal operation.***

Weigh Mode

A:1:O.CalMode	0		Decimal	BOOL
A:1:O.WeighMode	1		Decimal	BOOL
A:1:O.AutoCalMode	0		Decimal	BOOL

Auto-Cal Mode

A:1:O.CalMode	0		Decimal	BOOL
A:1:O.WeighMode	1		Decimal	BOOL
A:1:O.AutoCalMode	1		Decimal	BOOL

Filtering

To ensure accurate and smooth readings the 5034-WM-HM incorporates user adjustable filtering. This complex filtering can be likened to a rolling average filter. As the value of the AvgSampleCount tag is increased the weigh value produced by the module will have less fluctuation. **It is recommended to start low and then increase the filtering value to balance responsiveness with adequate filtering.**

A:1:O.AvgSampleCount	100		Decimal	UDINT

Diagnostics and Troubleshooting

CalMode

During CalMode, instead of a calculated load measurement being outputted the module provides the raw force measurement value in the “Ch0X_Weight” input tags. This can be helpful when debugging issues with the loadcell or overall setup of the application.

Track Out

Track out is the analog voltage being used by the module to accurately measure the force on the loadcell. This can be used to ensure the module circuitry or load cell is functioning correctly. The analog voltage measured at TK1 or TK2 (Located on the RTB, refer to the wiring diagram) is dependent on the resistance and mV/V of the loadcells connected to that specific channel. The output voltage at the TK of each channel is specific to the loadcells configuration wired to that channel.

Readout Tags

Readout tags allow a user view values that are internally stored or used by the module for calibration and calculation. When a readout tag is enabled, the corresponding variable is displayed in the “Ch0X_Weight” input tag. This enables a user to verify the value written during calibration or in the output tags is accurate and being used by the module. “Readout tags are not necessary for general operation of the module. Below are a simple breakdown of each tag and the value they return when enabled.

Tag Name	Output	Purpose
O.Read_mV_V	mV/V	A double check to ensure the user put the correct mV/V in the output tag
O.ReadScale	Scale	Scale is only written using “SetScale” tag, this verifies it was written.
O.ReadADTrim	ADTRIM	ADTRIM is a factory calibration value used by Helm Instrument for troubleshooting.

Overlay LEDs

The front overlay of the module shown in the image below gives numerous ways of indicating operating modes and potential issues. Behavior of the “MODE” and “FAULT” LEDs are described below.

LED Name	LED Status	Description
MODE	OFF	CalMode is active
	SOLID YELLOW	WeighMode is active
	FLASHING RED & YELLOW	Incorrect mode configuration
FAULT	OFF	No Fault
	SOLID RED	Fault, Check module status bits for fault type

I/O Tags: Definitions and Functional Behavior

Below are detailed explanations of each I/O tag and their usage.

Input

Tag Name	Usage
I.RunMode	Not controlled by the module
I.ConnectionFaulted	Not controlled by the module, it shows if the connection is faulted or not
I.ModuleStatus	Reports the status of the module as well as faults
I.Ch01_Weight	Reports the current weight value (also is used to show various other values like mV/V and scale value)
I.Ch02_Weight	Reports the current weight value (also is used to show various other values like mV/V and scale value)

Output

Tag Name	Usage
O.CalMode	Outputs the raw counts from the module, used for troubleshooting and calibration
O.WeighMode	Outputs the calculated measured load
O.AutoCalMode	Switches calculation logic to use Auto-Cal calibration values instead of standard cal
O.Read_mV_V	Outputs the mV/V value each channel uses in its corresponding “I.Ch0X_Weight” tag
O.ReadScale	Outputs the scale value each channel uses in its corresponding “I.Ch0X_Weight” tag
O.ReadADTrim	Outputs the ADTRIM value each channel uses in its corresponding “I.Ch0X_Weight” tag
O.SaveToEEPROM	Writes calibration, scale, and tare to flash for storage.
O.AvgSampleCount	Increases or decreases filtering
O.Ch01	Contains tag substructure associated with channel 1
O.Ch02	Contains tag substructure associated with channel 2
Each channel has the same sub-tag structure	
O.Ch0X.ClearTare	Restores the absolute force reading with no modification
O.Ch0X.SetTare	Zeros the force reading using the current value so existing load is ignored
O.Ch0X.SetScale	Writes the value in “O.Ch0X.Scale” tag internally to the module. ***The module will not store the value in the scale tag until the “O.Ch0X.SetScale” tag toggled.***
O.Ch0X.AutoCal	Runs automatic calibration calculation for that channel
O.Ch0X.Scale	Storage for the full-scale of the load cell for that channel. ***The module will not store the value in the scale tag until the “O.Ch0X.SetScale” tag is toggled.***
O.Ch0X.mV_V	Millivolt per volt rating of the load cell

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